COMPUTER APPLICATIONS

Maximum Marks: 100

Time allowed: Two hours

Answers to this Paper must be written on the paper provided separately.

*You will **not** be allowed to write during the first **15** minutes.*

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

*This Paper is divided into **two** Sections.*

*Attempt **all** questions from **Section A** and **any four** questions from **Section B.***

The intended marks for questions or parts of questions are given in brackets[ ].

SECTION A (40 Marks)

*(Attempt **all** questions from this **Section**.)*

Question 1   [20]

Choose the correct answers to the questions from the given options.

(Do not copy the questions, write the correct answers only.)

(i)   A mechanism where one class acquires the properties of another class:

        (a)   Polymorphism

        (b)   Inheritance

        (c)   Encapsulation

        (d)   Abstraction

(ii)   Identify the type of operator **&&**:

        (a)   ternary

        (b)   unary

        (c)   logical

        (d)   relational

(iii)   The Scanner class method used to accept words with space:

    (a)   next()

    (b)   nextLine()

    (c)   Next()

    (d)   nextString()

(iv)   The keyword used to call *package* in the program:

    (a)   extends

    (b)   export

    (c)   import

    (d)   package

(v)   What value will Math.sqrt (Math.ceil (15.3)) return?

    (a)   16.0

    (b)   16

    (c)   4.0

    (d)   5.0

(vi)   The absence of which statement leads to *fall through* situation in switch case statement?

    (a)   continue

    (b)   break

    (c)   return

    (d)   System.exit(0)

(vii)   State the type of loop in the given program segment:

        for (int i = 5; i ! = 0; i - = 2)

        System.out.println(i);

    (a)   finite

    (b)   infinite

    (c)   null

    (d)   fixed

(viii)   Write a method prototype name **check**() which takes an integer argument and returns a char:

    (a)   char check()

    (b)   void check (int *x*)

    (c)   check (int *x*)

    (d)   char check (int *x*)

(ix)   The number of values that a method can **return** is:

    (a)   1

    (b)   2

    (c)   3

    (d)   4

(x)   Predict the output of the following code snippet: String P = "20", Q ="22";

       int a = Integer.parseInt(P);

       int b = Integer.valueOf(Q);

       System.out.println(a+""+b);

    (a)   20

    (b)   20 22

    (c)   2220

    (d)   22

(xi)   The String class method to **join** two strings is:

    (a)   concat(String)

    (b)   <string>.joint(string)

    (c)   concat(char)

    (d)   Concat()

(xii)   The output of the function "COMPOSITION".substring(3, 6):

    (a)   POSI

    (b)   POS

    (c)   MPO

    (d)   MPOS

(xiii)   int *x* = (int) 32.8; is an example of _____ typecasting.

        (a)   implicit

        (b)   automatic

        (c)   explicit

        (d)   coercion

(xiv)   The code obtained after *compilation* is known as:

        (a)   source code

        (b)   object code

        (c)   machine code

        (d)   java byte code

(xv)   Missing a semicolon in a statement is what type of error?

        (a)   Logical

        (b)   Syntax

        (c)   Runtime

        (d)   No error

(xvi)   Consider the following program segment and select the output of the same when n = 10 :

```
switch(n)
{case 10 : System.out.println(n*2);
case 4 : System.out.println(n*4); break;
default : System.out.println(n);
}
```

        (a)   20
             40

        (b)   10
              4

        (c)   20, 40

        (d)   10
             10

(xvii)   A method which does not *modify* the value of variables is termed as:

      (a)   Impure method

      (b)   Pure method

      (c)   Primitive method

      (d)   User defined method

(xviii)   When an object of a Wrapper class is converted to its corresponding primitive data type, it is called as _____.

      (a)   Boxing

      (b)   Explicit type conversion

      (c)   Unboxing

      (d)   Implicit type conversion

(xix)   The number of *bits* occupied by the value 'a' are:

      (a)   1 bit

      (b)   2 bits

      (c)   4 bits

      (d)   16 bits

(xx)   Method which is a part of a *class* rather than an instance of the class is termed as:

      (a)   Static method

      (b)   Non static method

      (c)   Wrapper class

      (d)   String method

Question 2

(i)   Write the Java expression for $(a + b)^x$.   [2]

(ii)   Evaluate the expression when the value of $x = 4$:   [2]

$x * = - - x + x++ + x$

(iii)   Convert the following do…while loop to for loop: [2]

int x=10;

do

{x– –;

System.out.print(x);

}while (x>=1);

(iv)   Give the output of the following Character class methods: [2]

(a)   Character.toUpperCase ('a')

(b)   Character.isLetterOrDigit('#')

(v)   Rewrite the following code using the if-else statement: [2]

int m= 400;

double ch = (m>300) ? (m / 10.0) * 2: (m / 20.0) - 2;

(vi)   Give the output of the following program segment: [2]

int n = 4279; int d;

while(n>0)

{d=n%10;

System.out.println(d);

n=n/100;

}

(vii)   Give the output of the following String class methods: [2]

(a)   "COMMENCEMENT" . lastIndexOf('M')

(b)   "devote" . compareTo("DEVOTE")

(viii)   Consider the given array and answer the questions given below: [2]

int x[ ]={4,7,9,66,72,0,16};

(a)   What is the length of the array?

(b)   What is the value in x[4]?

(ix)   Name the following: [2]

(a)   What is an instance of the class called?

(b)   The method which has same name as that of the class name.

(x)   Write the value of *n* after execution: [2]

char ch ='d';

int n = ch + 5;

SECTION B (60 Marks)

*(Answer **any four** questions from this **Section**.)*

The answers in this section should consist of the programs in either BlueJ environment or any program environment with java as the base.

Each program should be written using variable description / mnemonic codes so that the logic of the program is clearly depicted.

Flowcharts and algorithms are not required.

Question 3   [15]

Design a class with the following specifications:

Class name: **Student**

Member variables: name – name of student

age – age of student

mks –marks obtained

stream – stream allocated

(Declare the variables using appropriate data types)

Member methods:

void **accept**()   –   Accept name, age and marks using methods of Scanner class.

void **allocation**() –   Allocate the stream as per following criteria:

mks	stream
>= 300	Science and Computer
>= 200 and < 300	Commerce and Computer
>= 75 and 200	Arts and Animation
< 75	Try Again

void **print**()   –   Display student name, age, mks and stream allocated.

Call all the above methods in main method using an object.

Question 4   [15]

Define a class to accept 10 characters from a user. Using **bubble sort** technique arrange them in ascending order. Display the sorted array and original array.

Question 5 [15]

Define a class to overload the function **print** as follows:

void **print**()	to print the following format

1   1   1   1

2   2   2   2

3   3   3   3

4   4   4   4

5   5   5   5

void **print**(int n)　　　　　　　To check whether the number is a lead number. A lead number is the one whose sum of even digits are equal to sum of odd digits.

e.g. 3669　　　odd digits sum = 3 + 9 = 12

　　　　　　even digits sum = 6 + 6 = 12

3669 is a lead number.

Question 6 [15]

Define a class to accept a String and print the number of digits, alphabets and special characters in the string.

Example:　S = "KAPILDEV@83"

Output:　　Number of digits – 2

　　　　　Number of Alphabets – 8

　　　　　Number of Special characters – 1

Question 7 [15]

Define a class to accept values into an array of double data type of size 20. Accept a double value from user and search in the array using **linear search** method. If value is found display message "Found" with its position where it is present in the array. Otherwise display message "not found".

Question 8 [15]

Define a class to accept values in integer array of size 10. Find sum of *one digit* number and sum of *two digit* numbers entered. Display them separately.

Example:　Input:　　a[ ] = {2, 12, 4, 9, 18, 25, 3, 32, 20, 1}

　　　　　Output:　Sum of one digit numbers : 2 + 4 + 9 + 3 + 1 = 19

　　　　　　　　　Sum of two digit numbers : 12 + 18 + 25 + 32 + 20 = 107